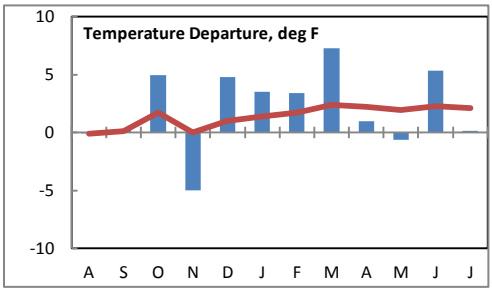
Montana Weather/Precipitation Summary

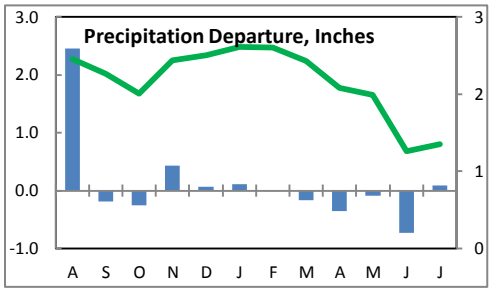
July 2015 by NOAA's National Weather Service Great Falls Montana

Under an upper level pattern that was near normal for July (Fig. 1), the month delivered near normal temperatures and mostly above normal precipitation. The notable exception was over the northwest. There were a few record warm high temperatures set early in the month, and a very cool period on the 5th and 27th. Record cool maximum temperatures were set at varied locations on these dates.

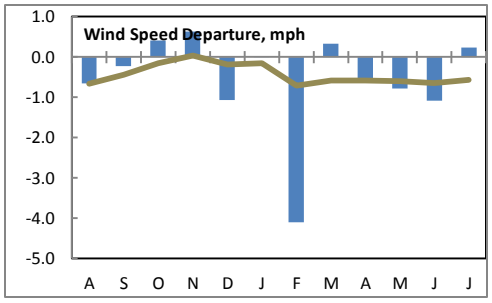
Statewide composite temperatures averaged 0.2°F above normal for the month. The temperature anomalies ranged from -2.4°F at West Yellowstone to +1.7°F at Wolf Point (Fig. 2). The warmest average monthly temperature was 74.4°F at Miles City, and the coolest was 49.9°F at Placer Basin. This was the 63rd coolest July of record. For the past 12-months, the statewide composite average temperature is 2.1°F above normal. Nine of the last 12 months have had warmer than normal temperatures.



The monthly departure from normal for precipitation across Montana is shown in Figure 3. Above normal precipitation was over southeast Montana, while the western half was dry. The highest amount was 5.33-inches near Hogeland and 6.20-inches at Brackett Creek. Statewide, this month averaged 1.65-inches, or 0.09-inches above normal. The statewide composite precipitation for the past 12 months is 1.35-inches above normal.



The statewide average winds were above normal this month, ranking as the 33rd calmest July of record. The statewide composite average was 8.3 mph, 0.2 mph below normal. The 12-month average is running 0.6-mph below average. The fastest average speed was 11.7 mph at Fort Belknap. The fastest measured gust of the month, 91 mph, occurred at Big Sandy on the 4th.



Outside of two notable wet periods, regular precipitation was lacking. As such, soil moisture continued to dry out across the state. The July average had a 2.6 point negative departure. This was the first negative departure since September 2013. This July ranked as the 3rd driest soil moisture of record. Records began in 1995.

Refer to NCDC's State of the Climate report for the latest monthly discussion: http://www.ncdc.noaa.gov/sotc/.

July 1-4

The first few days of July were on the warm side, a continuation of the late June warmth. Thunderstorms on the 1st produced gusts to 70 mph near Busby and Plevna. Another cluster of storms produced one-inch hail and 64 mph wind gusts at Fort Benton. Some record warm temperatures were set on the 3rd. A strong cold front pushed into northern Montana on the 4th. Severe thunderstorms raked the hi-line with large hail, strong winds and funnel clouds. Gusts reached 91 mph at Big Sandy, with wide swaths of hail destroying crops and hail and wind damaging many structures between Chester and Malta. Several power poles were snapped south of Malta as this system pushed across southern Phillips County.

July 5-14

On the 5th, cool air spread over central Montana, while warm air continued across the west and east. Libby reached 103°F, while severe thunderstorms caused damage across scattered location

in eastern Montana. Near Lindsay, gusts reached 83 mph. Great Falls and Cut Bank set new daily cold maximum temperatures, staying in the 50s. This was the coolest day in July at each location since 1999. The low temperature at Marias Pass was 30°F, their coolest July temperature since 1999. Areas of heavy rain spread over west central and southwest Montana on the 11th. Nearly 1.5-inches of rain fell over portions of Mineral County. Missoula set a daily rainfall record, measuring 0.83-inches. Meanwhile, an isolated thunderstorm moved north of Chester, producing a 65 mph wind gust. On the 14th, another thunderstorm produced a 70 mph gust at Busby.

July 15-26
A quieter period with variable temperatures prevailed. No major weather happenings occurred during this period. Temperatures were 10 to 15 degrees below normal on the 17th, but they rebounded to slightly above normal by the 19th, and stayed this way through the 26th.

July 27-31
A cold front moved through the state on the 27th. One-inch hail fell over portions of Carbon County. Up to an inch of rain fell from near Havre, through the Great Falls area, and west to Granite County. Temperatures stayed in the 50s in portions of central Montana. Thunderstorm wind damage was reported north of Scobey and in the Glendive area. Wind gusts reached at least 90 mph at Glendive, before the anemometer was damaged. Damage in the area caused an estimated wind speed even higher.

Precipitation/convection

Severe convective weather occurred on 7 days in July. The normal for July is 11 days. Many of the severe weather reported is listed above.

July summary information:

High Temperature	103°F at Mizpah (4th) & Libby (5th)	**Greatest Precip**	5.33" near Hogeland
Low Temperature	24°F at Box Canyon (Park) (26th)		6.20" at Brackett Ck (Gallatin)
Warmest Ave Temp	74.4°F at Miles City	**Peak Wind Gust**	91 mph at Big Sandy (4th)
Coolest Ave Temp	49.9°F at Placer Basin		
Range of Temp departures	-2.4°F at West Yellowstone to +1.7° at Wolf Point	**Highest Ave Wind**	11.7 mph at Ft Belknap 13.1 mph at Deep Creek
21 city mean monthly Temperature/Normal	68.1/67.9F 0.2F above normal. 63rd coolest of record (since 1880). 46th percentile. Oct-Jul 42.1/39.6 1.5F above normal. 13th warmest of record.	**20 city mean monthly wind speed/Normal**	8.3 mph/8.1 mph; 33rd calmest of record (since 1936). 40th percentile. Oct-Jul 8.9 mph/9.6 0.6-mph below normal. 16th calmest of record.
22 city mean monthly precipitation/Normal	1.68/2.41" – 69% of normal. 25th driest of record (since 1880). 19th percentile. Oct-Jun 9.97"/10.96" – 0.99" below normal. 39th driest of record.		

Historical Rank of Precipitation (inches)
for the Current Month and Water Year to Date

Location	Jul	% of Norm	Rank	Pcntl	Oct 1 - MM	% of norm	Rank	Pcntl	Years
Baker	0.80	56%			10.69	112%			17
Billings	1.66	130%	97	83	10.50	83%	61	53	114
Belgrade	1.78	159%	62	78	10.27	86%	25	31	78
Butte	1.86	138%	96	79	8.53	82%	37	30	121
Cut Bank	0.95	74%	51	46	7.85	93%	37	34	107
Dillon	1.31	105%	55	72	7.57	88%	38	50	75
Glasgow	1.75	98%	77	64	9.91	105%	58	50	115
Great Falls	1.43	95%	75	60	10.62	90%	43	34	123
Havre	3.27	199%	123	90	9.40	105%	71	52	135
Helena	1.28	108%	90	65	8.12	91%	46	33	137
Jordan	1.33	71%			10.15	99%			17
Kalispell	0.36	25%	21	17	12.80	88%	57	47	121
Lewistown	1.89	98%	73	61	12.50	91%	36	30	119
Livingston	1.17	80%	62	55	10.86	87%	39	35	109
Miles City	0.90	55%	53	38	7.31	70%	16	11	138
Missoula	1.52	148%	111	81	11.27	95%	61	47	130
Mullan Pass	2.16	182%	63	83	36.83	105%	43	58	73
Wolf Point	2.24	113%			7.55	76%			17
Glendive	1.50	80%	58	48	11.03	101%	54	48	112
Sidney	3.41	135%	67	89	11.67	98%	40	53	75
BZN-MSU	1.32	90%	79	59	13.16	78%	22	16	132

Rankings and Percentiles are 1=driest, higher numbers=wetter.
For an automated version of this chart, updated daily, go to
http://www.wrh.noaa.gov/tfx/dx.php?wfo=tfx&type=&loc=products&fx=PCPNTOTALS

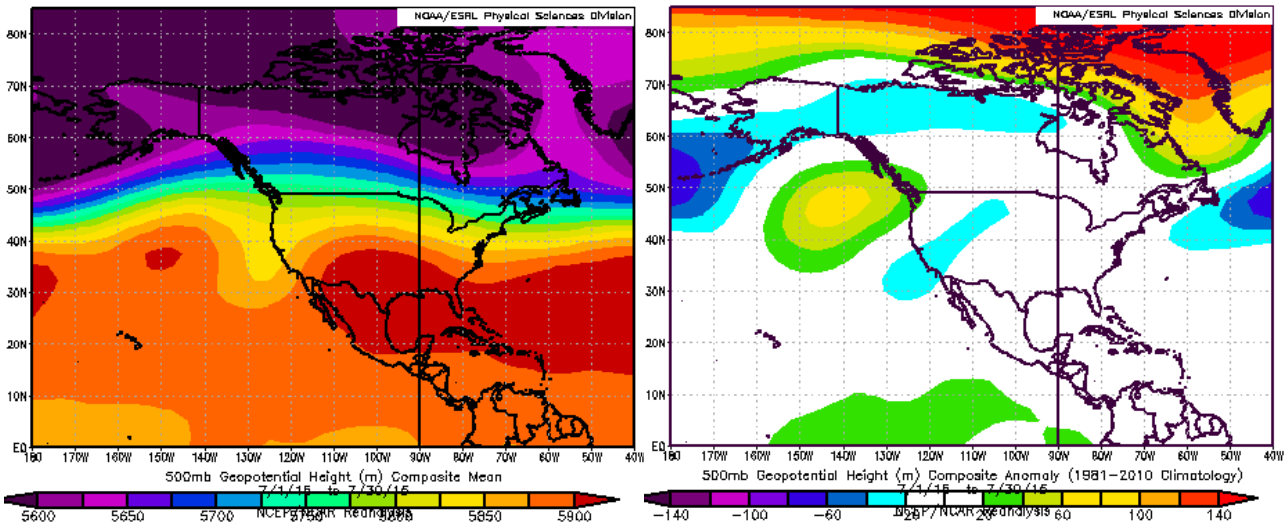


Figure 1. Mean flow at 500 millibars (~18,000 ft) for this month (top-left) and departure from normal (top-right).

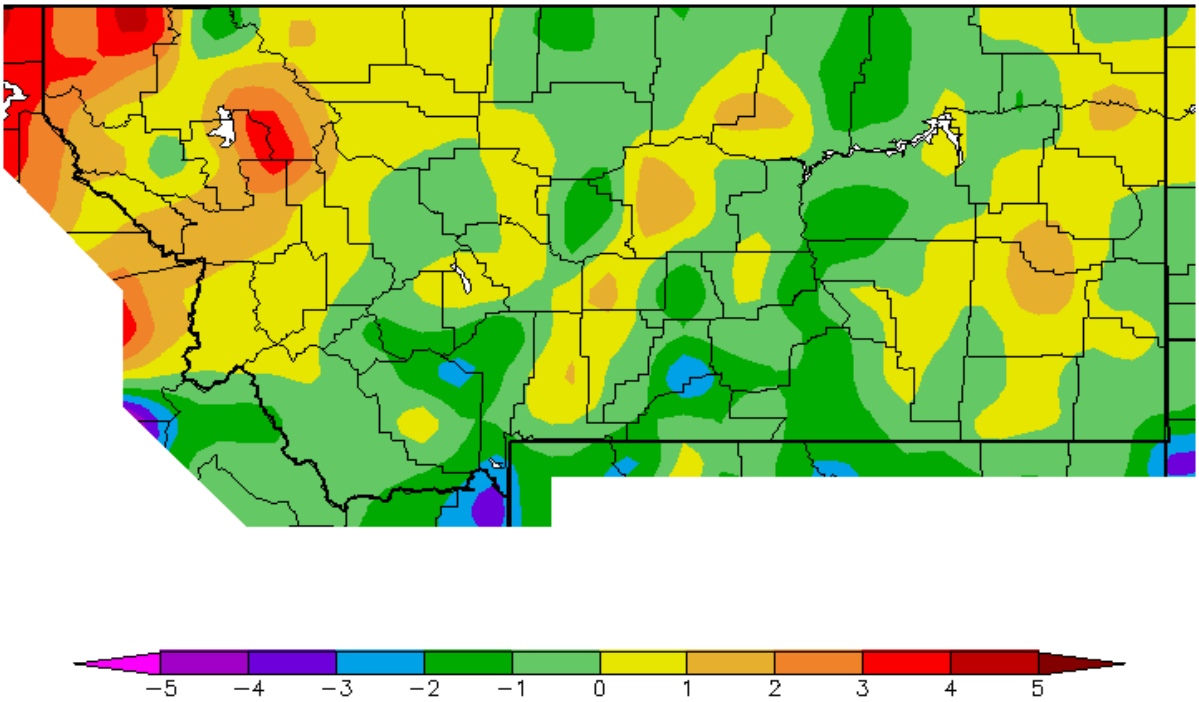


Figure 2. July 2015 temperature departures from normal (°F) (Western Region Climate Center).

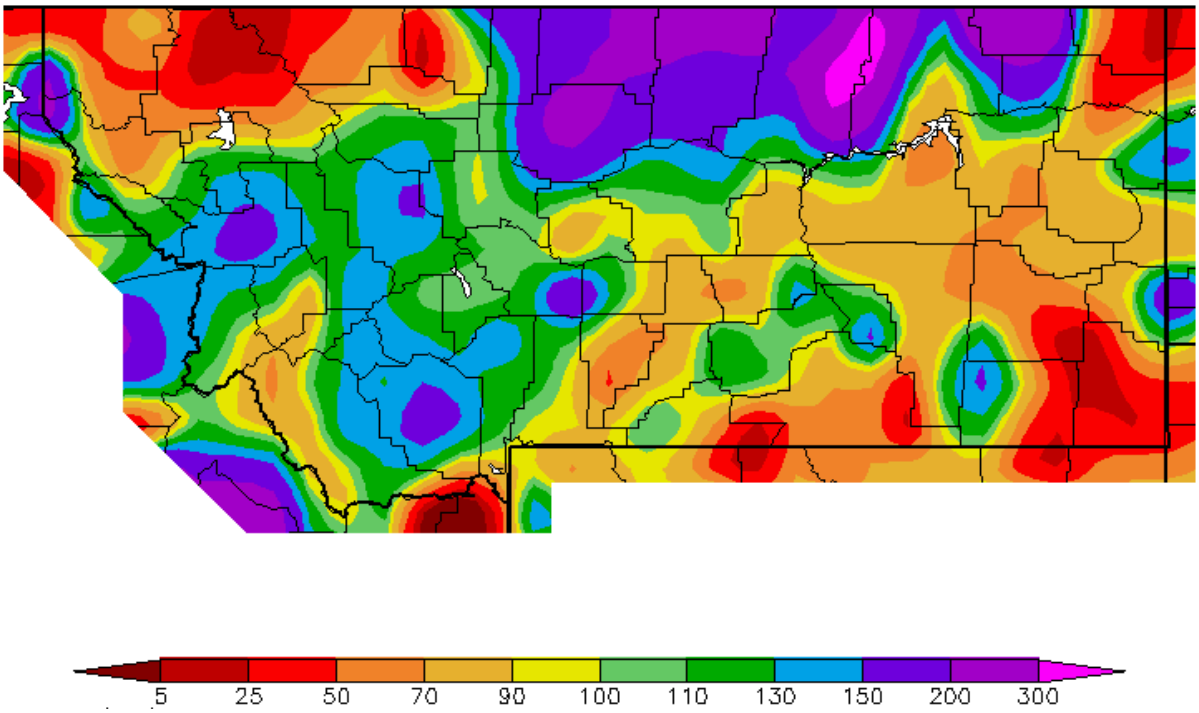


Figure 3. July 2015 precipitation departures from normal (percent) (Western Region Climate Center).

For a state map of % of normal water year precipitation (updated around the 7th of each month), go to: http://www.wrh.noaa.gov/tfx/climate/monthlysum/climatesum.php?wfo=tfx

For the latest information on mountain snowpack from the NRCS, go to: http://www3.wcc.nrcs.usda.gov/snow/index.html

For the latest U.S. Drought Monitor, issued weekly by the National Drought Mitigation Center, USDA and NOAA, go to: http://droughtmonitor.unl.edu/

These data are preliminary and have not undergone final QC by NCDC. Therefore, these data are subject to revision. Final and certified climate data can be access at the National Climatic Data Center (NCDC) http://www.ncdc.noaa.gov. Many more links are on the Drought Information Page of the NWS Great Falls web site at http://www.wrh.noaa.gov/tfx/main/drought.php?wfo=tfx. The climatological record for normals is 1981-2010. The ranking period for temperature, precipitation and snowfall is since 1880. The ranking period for wind speeds is since 1936. The ranking period for soil moisture is since 1995.